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Kaneko et al.

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(54) **VEHICULAR SEAT**

(71) Applicant: **TOYOTA JIDOSHA KABUSHIKI KAISHA**, Toyota-shi, Aichi (JP)

(72) Inventors: **Akira Kaneko**, Toyota (JP); **Shunsuke Tanaka**, Nisshin (JP)

(73) Assignee: **TOYOTA JIDOSHA KABUSHIKI KAISHA**, Toyota (JP)

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See application file for complete search history.

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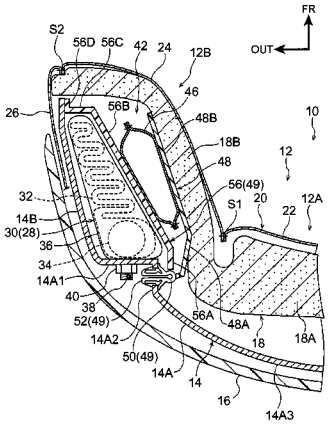
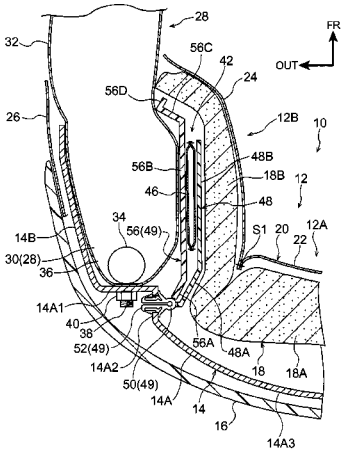
Primary Examiner — Nicole Verley
(74) *Attorney, Agent, or Firm* — Oliff PLC

(57) **ABSTRACT**

In a vehicular seat, a side airbag module and a side support bladder are arranged inside a shell frame that constitutes a skeleton of a seat back. A base bracket of a support body is disposed between the side support bladder and the side airbag module. This base bracket is supported by the shell frame. The base bracket supports the side support bladder from outside in a seat width direction at the time of inflation of the side support bladder, and is rotated inward in the seat width direction around a hinge together with the side support bladder due to an inflation pressure of a side airbag at the time of inflation and deployment of the side airbag.

8 Claims, 8 Drawing Sheets





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B60N 2/58	(2006.01)

(52) **U.S. Cl.**

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FIG. 1

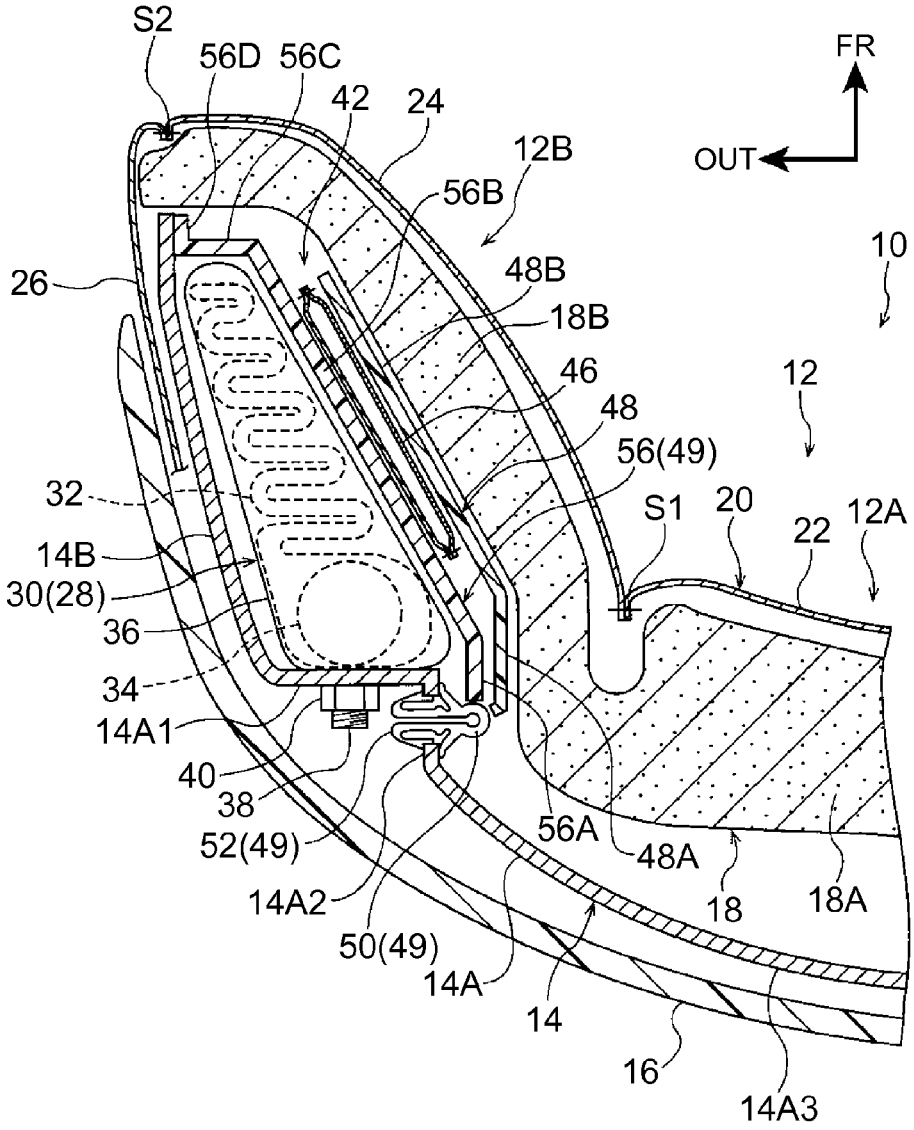

S2
56D
56C
42
24
12B
56B
FR
OUT
10
26
48B
18B
46
12
48
56(49)
32
S1
20
22
12A
14B
30(28)
36
34
14A1
40
38
52(49)
14A2
50(49)
14A
14
16
14A3
56A
48A
18
18A

FIG. 2

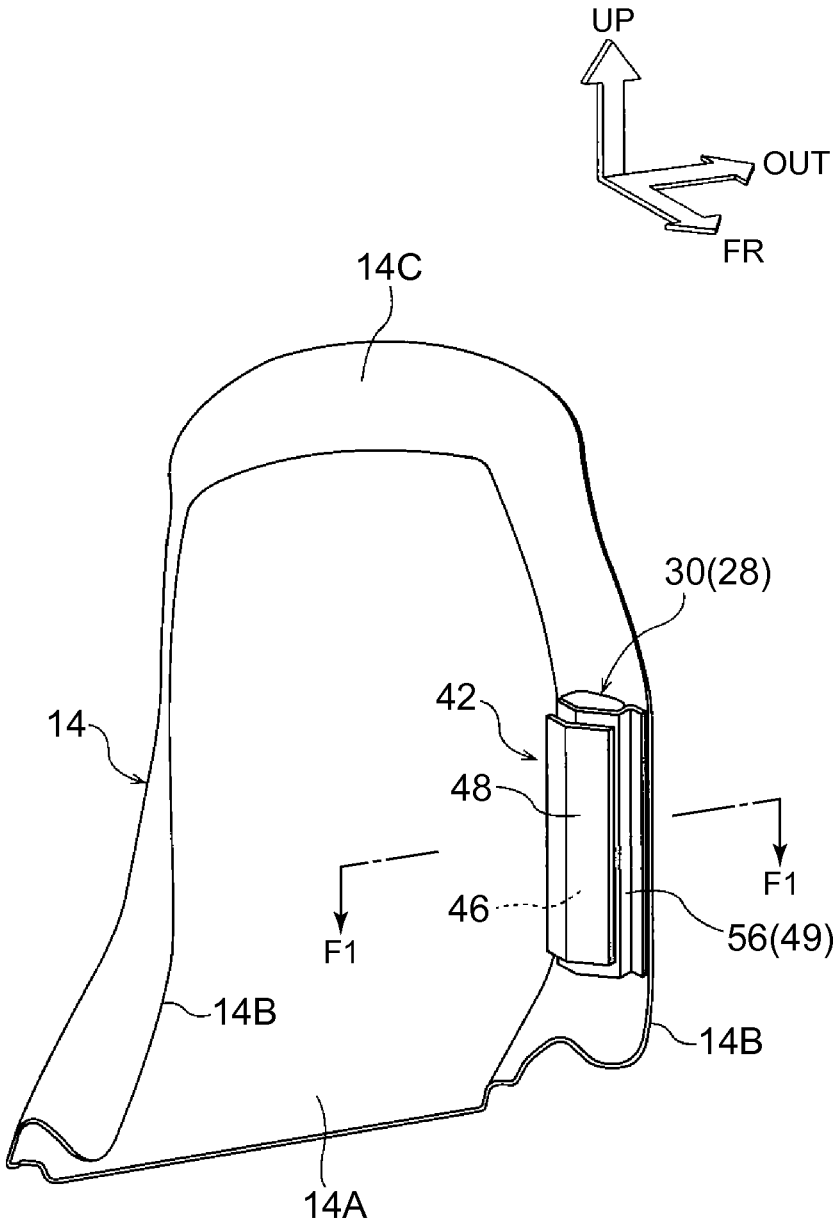
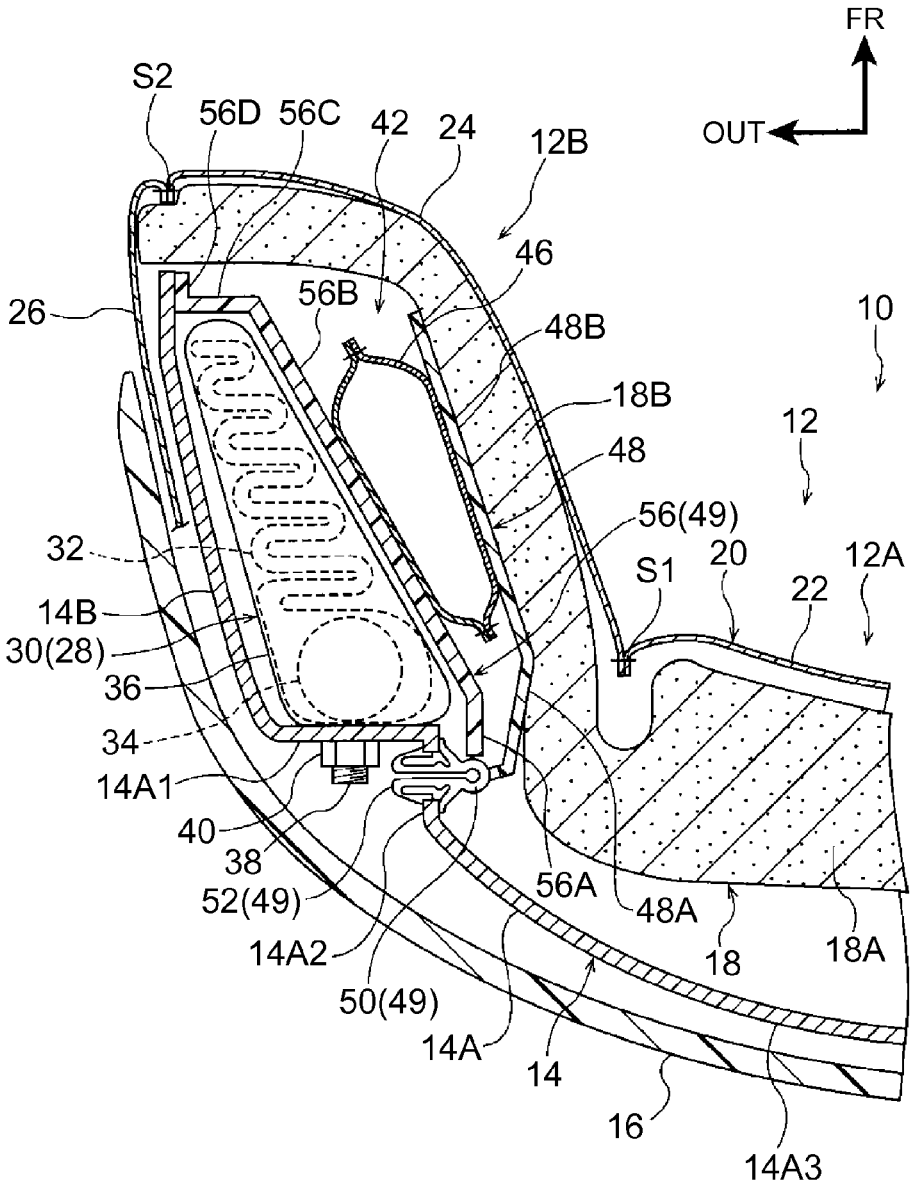


FIG. 3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S2
56D
56C
42
24
12B
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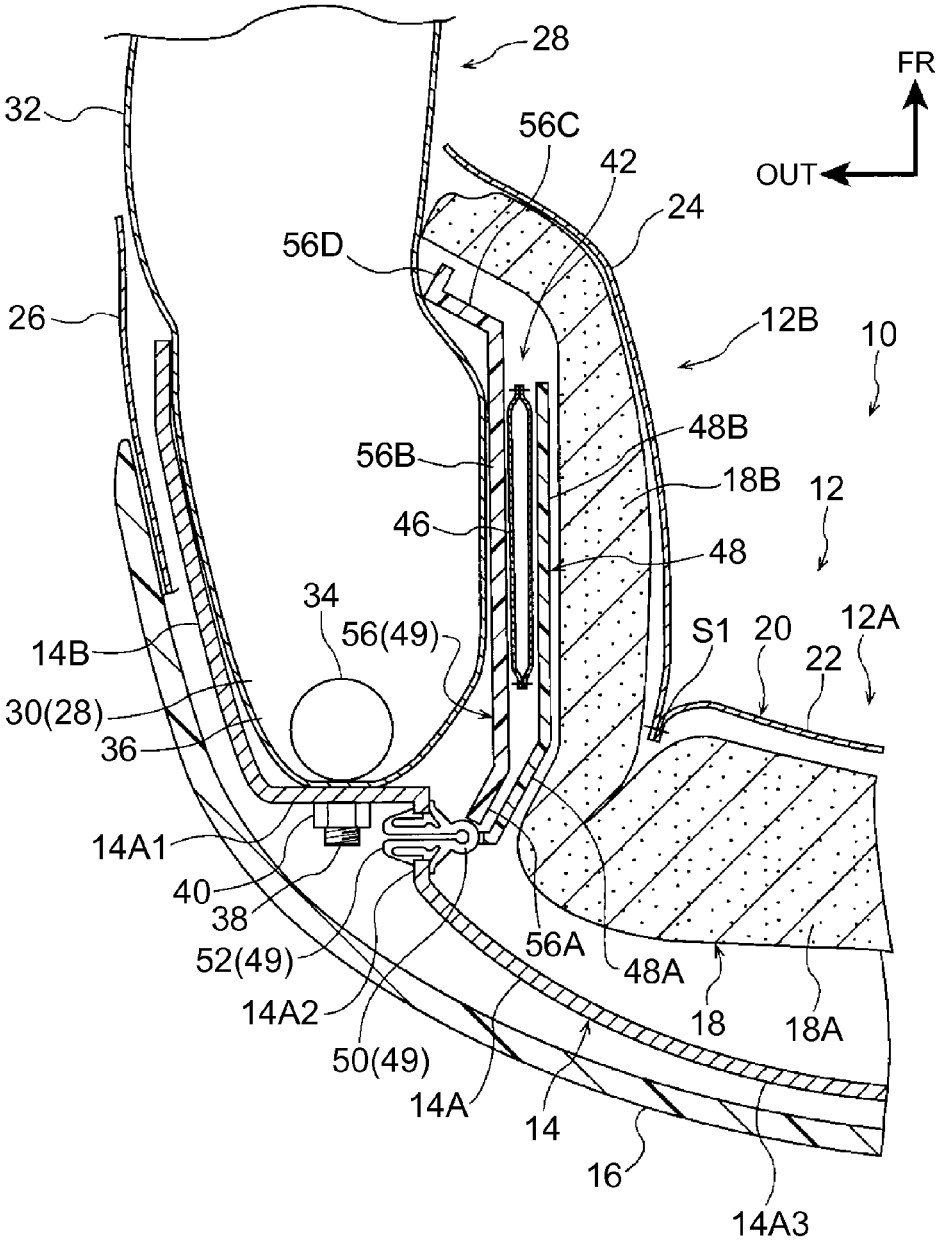
56B
26
48B
10
18B
12
48
56(49)
32
S1
20
12A
22
14B
30(28)
36
34
14A1
40
38
52(49)
56A
48A
18
18A
14A2
50(49)
14A
14
16
14A3

FIG. 4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FR
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32
56C
42
24
56D
26
12B
10
48B
56B
18B
12
46
48
34
56(49)
S1
20
12A
14B
22
30(28)
36
14A1
40
38
52(49)
56A
48A
14A2
18
18A
50(49)
14A
14
16
14A3

FIG. 5

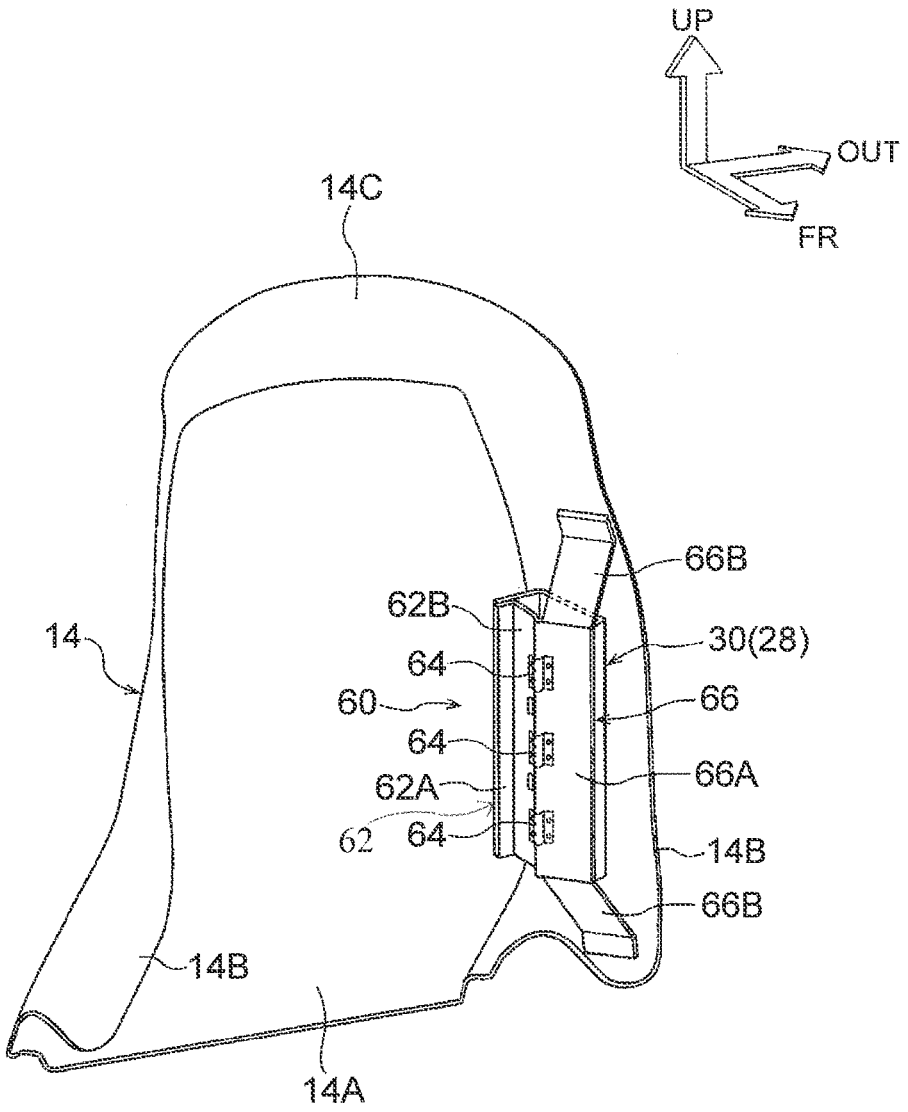

UP
OUT
FR
14C
66B
62B
30(28)
14
64
60
66
64
66A
62A
62
64
14B
66B
14B
14A

FIG. 6

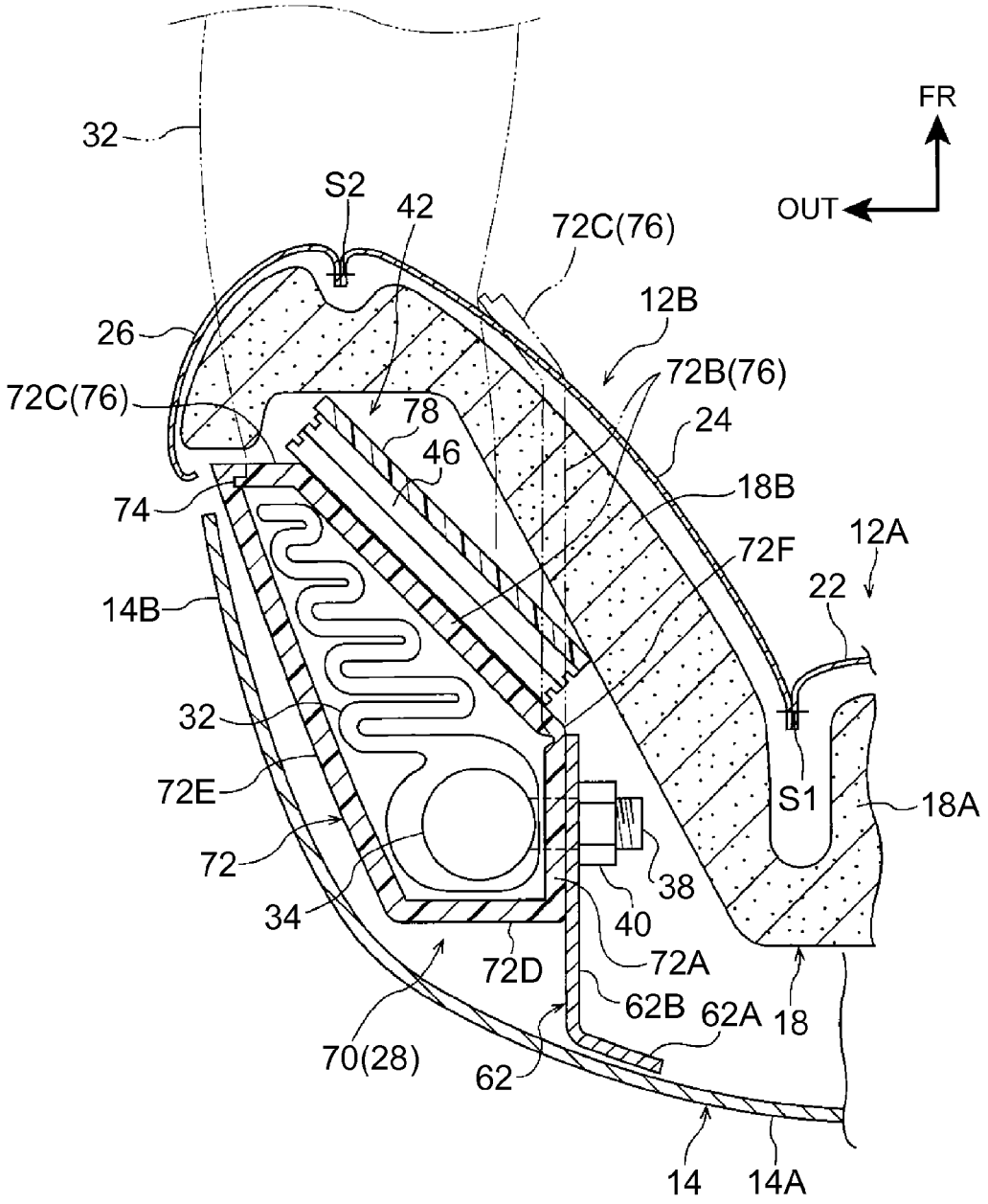

FR
OUT
32
S2
42
72C(76)
12B
26
72B(76)
72C(76)
78
24
46
18B
74
12A
72F
22
14B
32
72E
S1
18A
72
38
34
40
72A
72D
62B
62A
18
70(28)
62
14
14A

FIG. 7

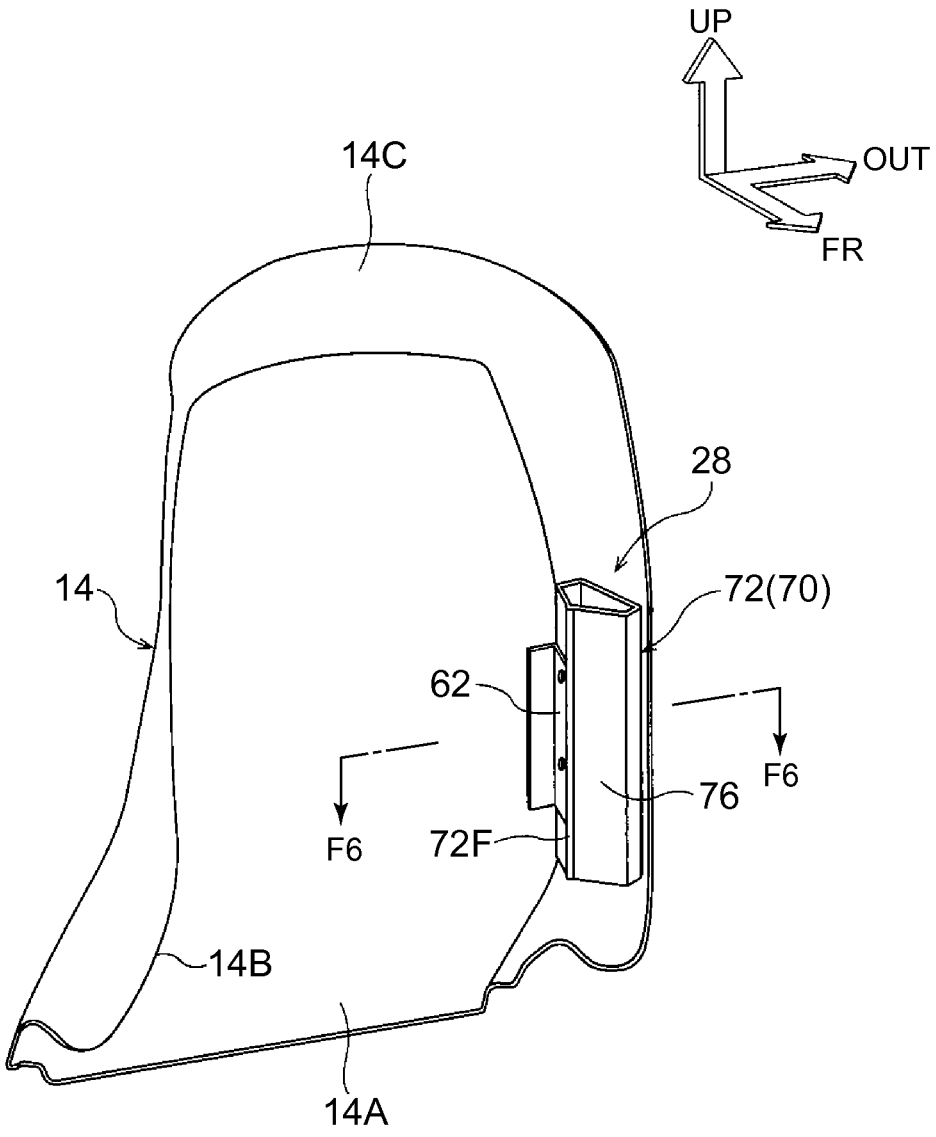
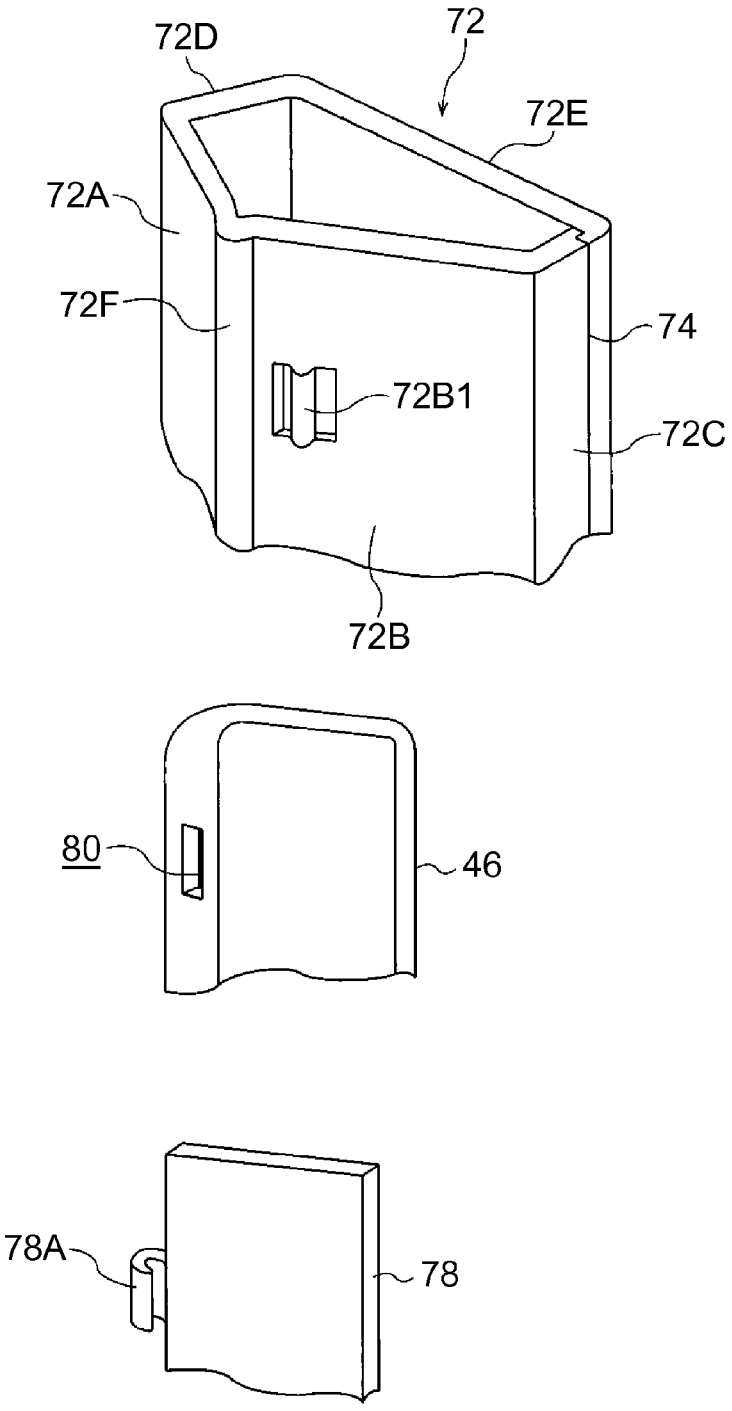


FIG. 8



VEHICULAR SEAT

TECHNICAL FIELD

The invention relates to a vehicular seat that is equipped with a side airbag device and an air bag-type side support adjustment mechanism.

BACKGROUND ART

For example, in a vehicular seat described in WO 2010/131322, a side airbag module is attached to an outer side of a side frame portion of a seat back frame in a seat width direction. Besides, a mechanical side support adjustment mechanism is attached to an inner side of the side frame portion in the seat width direction. This side support adjustment mechanism drives a paddle constituting a skeleton of a side support with the aid of a drive mechanism, thereby displacing the side support in the seat width direction. Part of the aforementioned paddle is located in an inflation and deployment region of a side airbag. At the time of inflation and deployment of the side airbag, the paddle receives an inflation pressure of the side airbag, and is displaced inward in the seat width direction. Thus, the side airbag is deployed in a favorable manner.

On the other hand, in a vehicular seat described in Japanese Patent Application Publication No. 2008-143363 (JP 2008-143363 A), a side airbag module is attached to an outer side of a lateral portion (a side frame portion) of a frame unit of a seat back in a seat width direction. Besides, an air bag-type side support adjustment mechanism is attached to an inner side of the side frame portion in the seat width direction. In this side support adjustment mechanism, an air bag (a bag body) is fixed to the side frame portion via a metallic support bracket. When air is introduced into this air bag, the air bag inflates while receiving a reaction force from the support bracket, and displaces a lateral portion support block (a side support) of the seat back inward in the seat width direction.

SUMMARY OF THE INVENTION

Problem to be Solved by the Invention

In view of the aforementioned facts, the invention provides a vehicular seat that makes it possible to enhance the degree of freedom in arranging a side airbag module with respect to an air bag-type side support adjustment mechanism.

Means for Solving the Problem

In a first aspect of the invention, there is provided a vehicular seat that is equipped with a side airbag device, a side support adjustment mechanism, and a support body. The side airbag device inflates and deploys a side airbag with which a side airbag module that is provided in a side support portion of a seat back is equipped, forward of the side support portion with respect to the seat. The side support adjustment mechanism has an air bag that is provided in the side support portion inside the side airbag module in a seat width direction, and inflates and contracts the air bag. The support body is provided between the side airbag module and the air bag, is supported by a skeleton of the seat back, supports the air bag from outside in the seat width direction at a time of inflation of the air bag, and is displaced inward in the seat width direction together with the air bag due to an inflation pressure of the side airbag at a time of inflation and deployment of the side airbag.

In the aforementioned aspect of the invention, the support body is provided between the side airbag module and the air bag of the side support adjustment mechanism in the side support portion of the seat back. This support body is supported by the skeleton of the seat back. When the air bag inflates, the support body supports the air bag from outside in the seat width direction. Thus, the air bag can be inflated inward in the seat width direction, so the side support portion can be moved inward in the seat width direction due to the inflation pressure of the air bag. Moreover, this support body is displaced inward in the seat width direction together with the air bag due to the inflation pressure of the side airbag, at the time of inflation and deployment of the side airbag. Thus, the inflation and deployment of the side airbag can be prevented from being hindered by the support body. Therefore, the degree of freedom in arranging the side airbag module with respect to the air bag-type side support adjustment mechanism can be enhanced.

A second aspect of the invention may be obtained by modifying the first aspect of the invention such that the support body has an abutment portion that abuts on the skeleton of the seat back from inside in the seat width direction.

According to the aforementioned configuration, the abutment portion of the support body abuts on the skeleton of the seat back from inside in the seat width direction. Therefore, when the air bag inflates, the support body can be firmly supported from outside in the seat width direction due to the rigidity of the skeleton of the seat back. Thus, the support body can be prevented or effectively restrained from being inadvertently displaced outward in the seat width direction. Incidentally, the aforementioned configuration is not limited to a configuration in which the abutment portion of the support body directly abuts on the skeleton of the seat back, but also includes a configuration in which the abutment portion of the support body indirectly abuts on the skeleton of the seat back via a rubber piece, a cloth or the like for preventing abnormal noise.

A third aspect of the invention may be obtained by modifying the first or second aspect of the invention such that the skeleton of the seat back is a shell frame having a rear wall portion that is arranged on a back face side of the seat back, and a lateral wall portion that extends forward with respect to the seat from an end portion of the rear wall portion in the seat width direction, and that the side airbag module and the air bag are arranged inside the lateral wall portion in the seat width direction.

In the aforementioned configuration, the skeleton of the seat back is the shell frame. The air bag-type side support adjustment mechanism and the side airbag module are arranged inside the lateral wall portion of this shell frame in the seat width direction. Even with this configuration, at the time of inflation and deployment of the side airbag, the support body that supports the air bag is displaced inward in the seat width direction together with the air bag, so the side airbag can be allowed to inflate and deploy. Moreover, the design of the back face and lateral face of the seat back can be constituted by the shell frame itself, so the seat back can be reduced in thickness and simplified in configuration.

A fourth aspect of the invention may be obtained by modifying any one of the first to third aspects of the invention such that the support body has a fixed portion that is fixed to the skeleton of the seat back, and a movable portion that is coupled at an end portion thereof on a rear side with respect to the seat to the fixed portion via a hinge

and that is arranged between the side airbag module and the air bag, and that the movable portion is allowed to rotate inward in the seat width direction around the hinge, and is restrained from rotating outward in the seat width direction around the hinge.

According to the aforementioned configuration, when the air bag of the side support adjustment mechanism inflates, the air bag is supported from outside in the seat width direction by the movable portion of the support body that is restrained from rotating outward in the seat width direction around the hinge. On the other hand, when the side airbag inflates and deploys, the aforementioned movable portion receives the inflation pressure of the side airbag, and is rotated inward in the seat width direction around the hinge together with the air bag. Thus, the side airbag is allowed to inflate and deploy. As described hitherto, the movable portion of the support body is configured to be rotated around the hinge. Therefore, the movable portion can be smoothly displaced inward in the seat width direction.

A fifth aspect of the invention may be obtained by modifying the fourth aspect of the invention such that the side support adjustment mechanism has a turning plate that is interposed between the air bag and a seat back pad in the side support portion, and that the turning plate is coupled at an end portion thereof on the rear side with respect to the seat to the fixed portion via the hinge.

According to the aforementioned configuration, when the air bag of the side support adjustment mechanism inflates inward in the seat width direction while being supported from outside in the seat width direction by the support body, the turning plate is displaced inward in the seat width direction around the hinge. The seat back pad in the side support portion can be efficiently pressed inward in the seat width direction by this turning plate. Moreover, the hinge to which the turning plate is coupled couples the movable portion of the support body to the fixed portion, and the hinge and the fixed portion are shared. Therefore, the number of parts can be reduced.

A sixth aspect of the invention may be obtained by modifying the first aspect of the invention such that the side airbag module is equipped with an airbag case that accommodates the side airbag therein in a folded state, and that the support body is constituted by a part of the airbag case.

According to the aforementioned configuration, the part of the airbag case with which the side airbag module is equipped is the support body that supports the air bag of the side support adjustment mechanism. Therefore, the support body can be assembled with the seat back by assembling the side airbag module with the seat back. Therefore, the man-hour of an assembling operation can be reduced in comparison with a case where the side airbag module and the support body are separately assembled with the seat back.

A seventh aspect of the invention may be obtained by modifying the sixth aspect of the invention such that the support body has an abutment portion that abuts on another part of the airbag case from inside in the seat width direction.

According to the aforementioned configuration, the abutment portion of the support body abuts on the other part of the airbag case from inside in the seat width direction. Therefore, when the air bag inflates, the support body can be thinly supported from outside in the seat width direction due to the rigidity of the other part of the airbag case. Thus, the support body can be prevented or effectively restrained from being inadvertently displaced outward in the seat width direction. Incidentally, the aforementioned configuration is not limited to a configuration in which the abutment portion of the support body directly abuts on the other part of the airbag case, but also includes a configuration in which the abutment portion of the support body indirectly abuts on the other part of the airbag case via a rubber piece, a cloth or the like for preventing abnormal noise.

An eighth aspect of the invention may be obtained by modifying the seventh aspect of the invention such that the side support adjustment mechanism has a turning plate that is interposed between the air bag and a seat back pad in the side support portion, and that the turning plate is coupled to a hook shaft that is formed on a part of the support body, via a hook portion that is provided at an end portion of the turning plate on a rear side with respect to the seat.

According to the aforementioned configuration, when the air bag of the side support adjustment mechanism inflates inward in the seat width direction while being supported from outside in the seat width direction by the support body, the turning plate is displaced inward in the seat width direction around the hook shaft via the hook portion that is provided at the end portion of the turning plate on the rear side with respect to the seat. The seat back pad in the side support portion can be efficiently pressed inward in the seat width direction by this turning plate.

Effect of the Invention

As described above, the vehicular seat according to the invention makes it possible to enhance the degree of freedom in arranging the side airbag module with respect to the air bag-type side support adjustment mechanism.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a planar cross-sectional view showing the configuration around a side support portion of a seat back of a vehicular seat according to a first embodiment of the invention, and corresponding to a line F**1**-F**1** of FIG. **2**.

FIG. **2** is a perspective view showing the configuration of peripheral members including a shell frame as a skeleton of the seat back.

FIG. **3** is a planar cross-sectional view showing an inflated state of a side support bladder, and corresponding to FIG. **1**.

FIG. **4** is a planar cross-sectional view showing an inflated and deployed state of a side airbag, and corresponding to FIG. **1**.

FIG. **5** is a perspective view showing the configuration of peripheral members including a shell frame of a seat back of a vehicular seat according to a second embodiment of the invention.

FIG. **6** is a planar cross-sectional view showing the configuration around a side support portion of the seat back of a vehicular seat according to a third embodiment of the invention, and corresponding to a line F**6**-F**6** of FIG. **7**.

FIG. **7** is a perspective view showing the configuration of peripheral members including a shell frame as a skeleton of the seat back.

FIG. **8** is an exploded perspective view showing the partial configuration of an airbag case, a side support bladder, and a paddle as components of the vehicular seat.

MODES FOR CARRYING OUT THE INVENTION

First Embodiment

A vehicular seat **10** according to an embodiment of the invention will be described hereinafter, using FIGS. **1** to **4**. Incidentally, outer sides of the vehicular seat **10** in a forward direction, an upward direction, and a width direction (a lateral direction) are denoted respectively by arrows FR, UP,

and OUT that are shown in the respective drawings if appropriate. Besides, in the present embodiment of the invention, the longitudinal, lateral and vertical directions of the vehicular seat **10** coincide with the longitudinal, lateral and vertical directions of the vehicle respectively. The front and rear in the longitudinal direction of the seat, the right and left in the lateral direction of the seat, and the up and down of the vertical direction of the seat will be indicated unless otherwise specified in particular, in the case where a description is given referring simply to the longitudinal, lateral and vertical directions.

Configuration

As shown in FIG. **1**, in the vehicular seat **10** according to the present embodiment of the invention, a skeleton of a seat back **12** is constituted by a shell frame **14**. As shown in FIG. **2**, this shell frame **14** is constituted of a rear wall portion **14**A, right and left lateral wall portions **14**B that protrude forward with respect to the seat from both end portions of the rear wall portion **14**A in a seat width direction respectively, and an upper wall portion **14**C that protrudes forward with respect to the seat from an upper end portion of the rear wall portion **14**A. The shell frame **14** is formed in the shape of a hull (the shape of a shell) such that a front side thereof with respect to the seat is open. The rear wall portion **14**A is arranged on a back face side of the seat back **12**. The right and left lateral wall portions **14**B are arranged on lateral face sides of the seat back **12** respectively. This shell frame **14** is covered with a resinous backboard **16** from a rear side with respect to the seat and from both outer sides in the seat width direction respectively.

A seat back pad **18** (a urethane pad, which is not shown in FIG. **2**) as a cushion material is attached to a front side of the shell frame **14** with respect to the seat. This seat back pad **18** is covered with a seat back skin **20** as a skin material, from the front side with respect to the seat.

The aforementioned seat back **12** is equipped with a body portion **12**A that supports a back of a sitting passenger from the rear side with respect to the seat, and right and left side support portions **12**B that are provided on both sides of the body portion **12**A in the seat width direction respectively (the side support portion **12**B that is located on the right side with respect to the seat is not shown in FIG. **1**). The right and left side support portions **12**B protrude forward of the body portion **12**A with respect to the seat, and is configured to support an upper body of the sitting passenger laterally.

The seat back pad **18** is integrally equipped with a pad body portion **18**A that is provided at the body portion **12**A, and right and left pad side portions **18**B that are provided at the right and left side support portions **12**B respectively (the pad side portion **18**B that is located on the right side with respect to the seat is not shown in FIG. **1**). The pad side portion **18**B diagonally extends forward with respect to the seat and outward in the seat width direction from an outer end portion of the pad body portion **18**A in the seat width direction.

Besides, the seat back skin **20** is constituted of a front skin **22** that covers the pad body portion **18**A from the front side with respect to the seat, a front side skin **24** that covers the pad side portion **18**B from the front side with respect to the seat and from inside in the seat width direction, and a side skin **26** that covers the pad side portion **18**B from outside in the seat width direction.

An outer end portion of the front skin **22** in the seat width direction is sewn to an inner end portion of the front side skin **24** in the seat width direction at a sewing portion S**1**. An outer end portion of the front side skin **24** in the seat width direction is sewn to a front end portion of the side skin **26** at a sewing portion S**2**. This side skin **26** is inserted in a gap between the lateral wall portion **14**B of the shell frame **14** and the backboard **16** on a lateral face side of the seat back **12**, and extends backward with respect to the seat. A rear end portion (not shown) of the side skin **26** is engaged with the shell frame **14**. Incidentally, the aforementioned sewing portion S**2** is configured to be ruptured when a later-described side airbag **32** inflates and deploys.

As shown in FIG. **1**, a side airbag module **30** that constitutes a main portion of a side airbag device **28** is disposed in the side support portion **12**B on the left side with respect to the seat (on a side door side (not shown) in this case). The side airbag module **30** is equipped with the side airbag **32** that is formed in the form of a bag by sewing a base fabric of, for example, nylon type or polyester type, and an inflator **34** (a gas generating device) that is accommodated inside the side airbag **32**. The side airbag **32** is folded according to a predetermined folding pattern (an accordion folding pattern in this case), and is wrapped by a wrapping material **36** that easily ruptures due to an inflation pressure of the side airbag **32**.

The inflator **34** is of a cylinder type, and is arranged such that an axis thereof extends along a height direction of the seat back **12**. A pair of upper and lower stud bolts **38** (only one of the stud bolts is shown in FIG. **1**) protrude backward with respect to the seat from an outer peripheral portion of this inflator **34**.

A fastening portion **14**A**1** is provided at the rear wall portion **14**A of the shell frame **14** in a manner corresponding to the stud bolt **38** of the inflator **34**. The fastening portion **14**A**1** extends inward in the seat width direction from a rear end portion of the lateral wall portion **14**B, and is opposed to the side airbag module **30** from the rear side with respect to the seat. A clip fixation portion **14**A**2** extends backward with respect to the seat from an inner end portion of this fastening portion **14**A**1** in the seat width direction, and a rear end portion of the clip fixation portion **14**A**2** is connected to an outer end portion of a body portion **14**A**3** of the rear wall portion **14**A in the seat width direction.

The stud bolt **38** of the inflator **34** penetrates the base fabric of the side airbag **32** and the aforementioned fastening portion **14**A**1** to be screwed into a nut **40**. Thus, the inflator **34** is fastened and fixed (subjected to so-called back face fastening) to the shell frame **14** together with the side airbag **32**. A side collision ECU (not shown) that is mounted in a vehicle is electrically connected to this inflator **34**. A side collision sensor (not shown) that detects a side collision is electrically connected to the side collision ECU.

The aforementioned lateral collision ECU activates the inflator **34** upon detecting (the unavoidableness of) a side collision based on a signal from the side collision sensor. Thus, the inflator **34** ejects gas in the side airbag **32**, and the side airbag **32** inflates and deploys forward of the side support portion **12**B that is located on the left side with respect to the seat, with respect to the seat. Incidentally, in the case where a pre-crash sensor that predicts (foresees) a side collision is electrically connected to the side collision ECU, the inflator **34** is configured to be activated when the side collision ECU predicts a side collision based on a signal from the pre-crash sensor.

A side support bladder **46** (an air bag) as a component of a side support adjustment mechanism **42** is disposed between the aforementioned side airbag module **30** and the pad side portion **18**B of the seat back pad **18**. An air supply source (not shown) is connected to this side support bladder **46** via an air supply tube (not shown). This air supply source is a component of the side support adjustment mechanism

42, and is constituted of an air supply pump, a changeover valve, a control unit and the like. For example, the control unit activates the air supply pump to supply air to the side support bladder **46** when an operation switch that is provided in the vehicular seat **10** is operated to one side, and activates the changeover valve to discharge air from the side support bladder **46** when the aforementioned operation switch is operated to the other side. Thus, the side support bladder **46** is configured to inflate and contract.

A paddle **48** (a turning plate) as a component of the side support adjustment mechanism **42** is disposed in a gap between the aforementioned side support bladder **46** and the pad side portion **18**B. This paddle **48** is molded in the shape of a plate from, for example, a resin material, and an end portion of the paddle **48** on the rear side with respect to the seat is coupled to a clip **52** via a hinge **50**. A through-hole that penetrates in the seat width direction is formed through the clip fixation portion **14**A**2** of the shell frame **14** in a manner corresponding to this clip **52**. The clip **52** is fitted in and engaged with the through-hole from inside in the seat width direction.

The hinge **50** that couples the paddle **48** and the clip **52** to each other extends in a vertical direction of the seat back **12**, and the paddle **48** can turn with respect to the clip **52** around an axis extending along the vertical direction of the seat back **12**. This paddle **48** is constituted of a base portion **48**A that extends forward with respect to the seat from the hinge **50**, and an inclined portion **48**B that diagonally extends forward with respect to the seat and outward in the seat width direction from a front end portion of the base portion **48**A. The inclined portion **48**B extends along the pad side portion **18**B, and the side support bladder **46** is interposed between the inclined portion **48**B and the side airbag module **30**.

Furthermore, in the present embodiment of the invention, a base bracket **56** (a reaction force plate) that constitutes a movable portion of a support body **49** is disposed between the side support bladder **46** and the side airbag module **30**. This base bracket **56** is molded in the shape of a plate from, for example, a resin material, and an end portion of the base bracket **56** that is located on the rear side with respect to the seat is coupled to the clip **52** via the foregoing hinge **50**. This clip **52** constitutes a fixed portion of the support body **49**. That is, in the present embodiment of the invention, the hinge **50** and the clip **52**, which couple the paddle **48** to the shell frame **14**, are shared as components of the support body **49**.

The aforementioned base bracket **56** can turn with respect to the clip **52** around the hinge **50** (around the axis extending along the vertical direction of the seat back **12**). This base bracket **56** is constituted of a base portion **56**A that extends forward with respect to the seat from the hinge **50**, a reception portion **56**B that diagonally extends forward with respect to the seat and outward in the seat width direction from a front end of the base portion **56**A, a front portion **56**C that extends outward in the seat width direction from a front end of the reception portion **56**B, and an abutment portion **56**D that extends forward with respect to the seat from an outer end portion of the front portion **56**C in the seat width direction. The base bracket **56** is located in an inflation and deployment region (a space in prospect of inflation and deployment) of the side airbag **32**.

The reception portion **56**B extends along the pad side portion **18**B. A face (a reception face) of the reception portion **56**B that is located inside in the seat width direction abuts on the side support bladder **46** from outside in the seat width direction. Besides, the abutment portion **56**D abuts on a front end portion of the lateral wall portion **14**B of the shell frame **14** from inside in the seat width direction. Therefore, the base bracket **56** is allowed to rotate inward in the seat width direction around the hinge **50**, and is restrained from rotating outward in the seat width direction around the hinge **50**.

Incidentally, although not shown in the drawings, in the vehicular seat **10** according to the present embodiment of the invention, the side support bladder **46**, the paddle **48**, the clip **52**, and the base bracket **56** as components of the side support adjustment mechanism **42** are disposed in the side support portion **12**B located on the right side with respect to the seat, symmetrically to those shown in FIG. **1**. It should be noted, however, that the side airbag module **30** is not disposed in the side support portion **12**B that is located on the right side with respect to the seat, and that the base bracket **56** that receives an inflation pressure of the side support bladder **46** is fixed in a non-displaceable manner to the lateral wall portion **14**B of the shell frame **14** that is located on the right side with respect to the seat.

Operation and Effect

Next, the operation and effect of the present embodiment of the invention will be described.

In the vehicular seat **10** configured as described above, the skeleton of the seat back **12** is constituted by the shell frame **14**. The side airbag module **30**, and the side support bladder **46** as a component of the side support adjustment mechanism **42** are arranged inside the lateral wall portion **14**B of the shell frame **14** in the seat width direction. Then, the base bracket **56** of the support body **49** is disposed between this side support bladder **46** and the side airbag module **30**. This support body **49** is supported by the shell frame **14**, and supports the side support bladder **46** from outside in the seat width direction (the other side of the sitting passenger) at the time of inflation of the side support bladder **46** (see FIG. **3**). Thus, the side support bladder **46** can be inflated inward in the seat width direction (toward the sitting passenger). Therefore, the side support portion **12**B can be moved inward in the seat width direction due to an inflation pressure of the side support bladder **46**.

Moreover, as shown in FIG. **4**, the base bracket **56** of this support body **49** is rotated (displaced) inward in the seat width direction around the hinge **50** together with the side support bladder **46** due to an inflation pressure of the side airbag **32** at the time of inflation and deployment of the side airbag **32**. Thus, the inflation and deployment of the side airbag **32** can be prevented from being hindered by the base bracket **56**. Therefore, the degree of freedom in arranging the side airbag module **30** with respect to the air bag-type side support adjustment mechanism **42** can be enhanced.

That is, in the present embodiment of the invention, both the side airbag module **30** and the side support bladder **46** are disposed inside the lateral wall portion **14**B of the shell frame **14** in the seat width direction. The base bracket **56** that applies an inflation reaction force to the side support bladder **46** is usually located in the inflation and deployment region of the side airbag **32**. From the standpoint of ensuring sitting comfort of the sitting passenger and the support performance of the side support portion **12**B, this base bracket **56** is disposed at such a position as to hinder the deployment of the side airbag **32**. However, as described above, the base bracket **56** is displaced inward in the seat width direction due to an inflation pressure of the side airbag **32**, so the side airbag **32** can be inflated and deployed in a favorable manner. Accordingly, the side airbag module **30** is not required to be arranged such that the inflation and deployment region of the side airbag **32** does not overlap with the

position where the base bracket **56** is disposed. As a result, the degree of freedom in arranging the side airbag module **30** is enhanced.

Moreover, in the present embodiment of the invention, the shell frame **14** is adopted. Therefore, the seat back **12** can be reduced in thickness, and the entire configuration of the vehicular seat **10** can be reduced in size. Besides, the air bag-type side support adjustment mechanism **42** is adopted. Therefore, the structure can be simplified, and the space, the number of parts, the mass, and the cost can be reduced in comparison with a case where a mechanical side support adjustment mechanism is adopted.

Furthermore, in the present embodiment of the invention, as shown in FIG. **4**, the base bracket **56** is displaced inward in the seat width direction together with the side support bladder **46** and the paddle **48** at the time of inflation and deployment of the side airbag **32**, so the side support portion **12**B is pressed inward in the seat width direction to swell inward in the seat width direction (toward the sitting passenger). Thus, the performance of initially restraining the sitting passenger can be enhanced, so the injury index of the sitting passenger can be lowered.

Besides, in the present embodiment of the invention, the side airbag **32** is arranged inside the lateral wall portion **14**B of the shell frame **14** in the seat width direction. Therefore, the side airbag **32** can be restrained from inflating outward in the seat width direction by the lateral wall portion **14**B at the time of inflation and deployment of the side airbag **32**. Thus, the side airbag **32** can be inflated and deployed forward with respect to the seat at an early stage, and the performance of initially restraining the passenger by the side airbag **32** can be enhanced.

Still further, in the present embodiment of the invention, the abutment portion **56**D that is provided at the front end portion of the base bracket **56** usually abuts on the lateral wall portion **14**B of the shell frame **14** from inside in the seat width direction. Therefore, when the side support bladder **46** inflates, the base bracket **56** can be firmly supported from outside in the seat width direction due to the rigidity of the shell frame **14**. Thus, the base bracket **56** can be prevented or effectively restrained from being inadvertently displaced outward in the seat width direction. Therefore, the reaction force from the base bracket **56** can be applied to the side support bladder **46** in a favorable manner.

Besides, in the present embodiment of the invention, the end portion of the base bracket **56** that is located on the rear side with respect to the seat is coupled to the clip **52** via the hinge **50**. The base bracket **56** is configured to be allowed to rotate inward in the seat width direction around the hinge **50**, and to be restrained from rotating outward in the seat width direction around the hinge **50**. In this manner, the base bracket **56** is configured to be rotated around the hinge **50**. Therefore, the base bracket **56** can be smoothly displaced inward in the seat width direction.

Furthermore, in the present embodiment of the invention, when the side support bladder **46** inflates inward in the seat width direction, the paddle **48** rotates inward in the seat width direction around the hinge **50**. The pad side portion **18**B can be efficiently pressed inward in the seat width direction by this paddle **48**. Moreover, the hinge **50** to which the paddle **48** is coupled couples the base bracket **56** to the clip **52**, and the hinge **50** and the clip **52** are shared. Therefore, the number of parts can be reduced.

Besides, in the present embodiment of the invention, the side airbag module **30** is arranged inside the lateral wall portion **14**B of the shell frame **14** (the side frame portion) in the seat width direction. Therefore, the lateral wall portion **14**B can be arranged more outward in the seat width direction than in a configuration in which the side airbag module **30** is arranged outside the lateral wall portion **14**B in the seat width direction. Besides, the base bracket **56**, the paddle **48** and the like that are arranged inside the lateral wall portion **14**B in the seat width direction can be manufactured with lower rigidity than the shell frame **14**. Therefore, in the event of a rear collision of the vehicle, the sitting passenger that is about to move through inertia backward of the seat back **12** with respect to the vehicle can be slipped into the seat back **12** in a favorable manner. As a result, the head of the sitting passenger can be brought into abutment on a headrest at an early stage, so the performance of protecting the neck of the sitting passenger can be enhanced.

Besides, in the present embodiment of the invention, the base portion **56**A extends backward with respect to the seat from the rear end portion of the reception portion **56**B of the base bracket **56**, and the rear end portion of the base portion **56**A is coupled to the clip **52** via the hinge **50**. Thus, the length dimension of the reception portion **56**B in a planar cross-sectional view can be set long while restraining the space for arrangement of the base bracket **56** from being enlarged inward in the seat width direction.

Besides, in the present embodiment of the invention, the fastening portion **14**A**1** that is provided on the shell frame **14** is opposed to the side airbag module **30** from the rear side with respect to the seat. Therefore, at the time of inflation and deployment of the side airbag **32**, the front face of the fastening portion **14**A**1** functions as a reaction force face that applies an inflation reaction force to the side airbag **32**. Thus, the inflation and deployment performance of the side airbag **32** can be made favorable.

(Supplemental Explanation of First Embodiment) The aforementioned first embodiment of the invention adopts a configuration in which the hinge **50** and the clip **52** are shared, by the base bracket **56** and the paddle **48**, but the invention is not limited thereto. It is also appropriate to adopt a configuration in which the base bracket **56** and the paddle **48** are provided separately with a hinge and a clip.

Besides, the aforementioned first embodiment of the invention adopts a configuration in which the paddle **48** (the turning plate) is provided, but the invention is not limited thereto. It is also possible to adopt a configuration in which the turning plate is omitted.

Furthermore, the support body **49** of the aforementioned first embodiment of the invention is configured such that the base bracket **56** (the movable portion) is rotatably coupled to the clip **52** (the fixed portion) via the hinge **50**, but the invention is not limited thereto. The support body **49** may also be configured such that the base bracket **56** is formed integrally with the clip **52**. In that case, for example, at the time of inflation and deployment of the side airbag, the clip **52** leaves the skeleton of the seat back due to an inflation pressure of the side airbag, so the support body **49** can be displaced inward in the seat width direction.

Besides, although the case where the skeleton of the seat back **12** is constituted by the shell frame **14** has been described in the aforementioned first embodiment of the invention, the invention is not limited thereto. The skeleton of the seat back **12** may also be constituted by a normal seat back frame that is equipped with right and left side frame portions, and an upper frame portion that couples upper end portions of the right and left side frame portions to each other in the seat width direction. In that case, for example, the side frame portion is constituted by the lateral wall portion **14**B, the fastening portion **14**A**1**, and the clip

fixation portion **14**A**2** in the aforementioned first embodiment of the invention, and the body portion **14**A**3** is omitted.

Next, other embodiments of the invention will be described. Incidentally, the configuration and operation basically similar to those of the first embodiment of the invention are denoted by the same reference symbols as in the first embodiment of the invention, and the description thereof will be omitted.

Second Embodiment

In FIG. **5**, the partial configuration of a vehicular seat according to the second embodiment of the invention is shown in the form of a perspective view corresponding to FIG. **2**. This embodiment of the invention is basically similar in configuration to the first embodiment of the invention, but a support body **60** is different in configuration from the support body **49** according to the first embodiment of the invention. This support body **60** is equipped with a fixed bracket **62** as a fixed portion.

The fixed bracket **62** is constituted of a fixed portion **62**A that is fixed to a front face of the rear wall portion **14**A of the shell frame **14**, and a front extension portion **62**B that extends toward the front side with respect to the seat from an outer end portion of the fixed portion **62**A in the seat width direction. The fixed portion **62**A and the front extension portion **62**B assume the shape of a flat plate. Incidentally, in the case where the material of the shell frame **14** is carbon etc., the fixed bracket **62** may be formed integrally with the shell frame **14**.

A reception face bracket **66** as a movable portion is coupled to a front end portion of the front extension portion **62**B of the fixed bracket **62** via a plurality of (three in this case) hinges **64** that are vertically aligned with one another. This reception face bracket **66** can rotate with respect to the fixed bracket **62** around the hinges **64** (around an axis extending along the vertical direction of the seat back). This reception face bracket **66** is constituted of a reception portion **66**A that is interposed between the side airbag module **30** and the side support bladder **46** (which is not shown in FIG. **5**), and a pair of upper and lower frame touch portions **66**B (abutment portions) that are extended from both upper and lower end portions of the reception portion **66**A respectively.

The reception portion **66**A is formed in the shape of a flat plate, and an inner face of the reception portion **66**A in the seat width direction abuts on the side support bladder **46** (which is not shown in FIG. **5**). The upper frame touch portion **66**B extends upward with respect to the seat and outward in the seat width direction from the reception portion **66**A, and an upper end portion (an outer end portion in the seat width direction) of the upper frame touch portion **66**B abuts on the inner face of the lateral wall portion **14**B of the shell frame **14** in the seat width direction. The lower frame touch portion **66**B extends downward with respect to the seat and outward in the seat width direction from the reception portion **66**A, and a lower end portion (an outer end portion in the seat width direction) of the lower frame touch portion **66**B abuts on the inner face of the lateral wall portion **14**B of the shell frame **14** in the seat width direction. The upper end portion of the upper frame touch portion **66**B and the lower end portion of the lower frame touch portion **66**B are flexed along the lateral wall portion **14**B, and is formed in surface contact with the lateral wall portion **14**B.

This reception face bracket **66** is allowed to rotate inward in the seat width direction around the hinges **64**, and is restrained from rotating outward in the seat width direction around the hinges **64** due to abutment of the upper and lower frame touch portions **66**B on the lateral wall portion **14**B. This embodiment of the invention is basically identical in the configurational details other than the foregoing to the first embodiment of the invention.

In this embodiment of the invention as well as the first embodiment of the invention, at the time of inflation of the side support bladder **46**, an inflation reaction force can be applied to the side support bladder **46** by the reception face bracket **66**. At the time of inflation and deployment of the side airbag **32**, the reception face bracket **66** rotates outward in the seat width direction around the hinges **64** together with the side support bladder **46** upon receiving an inflation pressure of the side airbag **32**, so the side airbag **32** can be allowed to inflate and deploy. Accordingly, this embodiment of the invention achieves an operation and an effect that are basically similar to those of the first embodiment of the invention.

Third Embodiment

In FIG. **6**, the partial configuration of a vehicular seat according to the third embodiment of the invention is shown in the form of a transverse cross-sectional view corresponding to FIG. **1**. In this embodiment of the invention, the backboard **16** in the first embodiment of the invention is omitted, and the design of the back face and the lateral faces of the seat back **12** is constituted by the shell frame **14** itself. Thus, the configuration of the seat back **12** is simplified.

Besides, in this embodiment of the invention, the fixed bracket **62** similar to that of the second embodiment of the invention is provided, and an airbag module **70** is fixed to the fixed bracket **62**. As is the case with the airbag module **30** in the first embodiment of the invention, this airbag module **70** is equipped with the side airbag **32** and the inflator **34**, and is arranged inside the lateral wall portion **14**B of the shell frame **14** in the seat width direction together with the side support bladder **46**. It should be noted, however, that this airbag module **70** is equipped with an airbag case **72** as opposed to the first embodiment of the invention.

The airbag case **72** is molded from, for example, a resin material, and is formed in the shape of a cylinder with a pentagonal cross-section (see FIG. **7**). This airbag case **72** is constituted of a fastening wall **72**A that abuts on an outer face of the front extension portion **62**B of the fixed bracket **62** in the seat width direction, a reception face wall **72**B that diagonally extends forward with respect to the seat and outward in the seat width direction from a front end portion of the fastening wall **72**A, a front wall **72**C that extends outward in the seat width direction from a front end portion of the reception face wall **72**B, a rear wall **72**D that extends outward in the seat width direction from a rear end portion of the fastening wall **72**A, and an outer wall **72**E that diagonally extends forward with respect to the seat and outward in the seat width direction from an outer end portion of the rear wall **72**D in the seat width direction.

The side airbag **32** that is folded in such a state as to accommodate the inflator **34** therein is accommodated inside the airbag case **72**. The stud bolt **38** of the inflator **34** penetrates the base fabric of the side airbag **32**, the fastening wall **72**A, and the front extension portion **62**B, and is screwed into the nut **40**. Thus, the side airbag module **70** that is configured to include the airbag case **72** is fastened and fixed (subjected to so-called lateral face fastening) to the shell frame **14** via the fixed bracket **62**.

A cutting line **74** that is formed in the shape of a crank in a planar cross-sectional view is set between the front wall

72C and the outer wall 72E of the airbag case 72. In a fitting structure on the cutting line 74, an outer end portion of the front wall 72C in the seat width direction is separably fitted to a front end portion of the outer wall 72E. Besides, an integral hinge 72F is provided between a rear end portion of the reception face wall 72B and a front end portion of the fastening wall 72A.

Therefore, when the side airbag 32 inflates due to the activation of the inflator 34, the aforementioned fitting of the front wall 72C and the outer wall 72E is cancelled due to an inflation pressure of the side airbag 32, and the reception face wall 72B and the front wall 72C are rotated (displaced) outward in the seat width direction around the integral hinge 72F. Thus, the airbag case 72 is opened forward with respect to the seat, and the side airbag 32 inflates and deploys forward of the side support portion 12B with respect to the seat (see an alternate long and two short dashes line of FIG. 6).

On the other hand, the reception face wall 72B and the front wall 72C are restrained from being rotated (displaced) outward in the seat width direction around the integral hinge 72F, due to abutment of the outer end portion (a touch portion) of the front wall 72C in the seat width direction on a front end portion of the outer wall 72E. That is, this reception face wall 72B and this front wall 72C are configured to be allowed to rotate inward in the seat width direction around the integral hinge 72F, and to be restrained from rotating outward in the seat width direction around the integral hinge 72F. Then, in the present embodiment of the invention, the support body 76 is constituted of this reception face wall 72B and this front wall 72C (i.e., part of the airbag case 72). This support body 76 is supported by the shell frame 14 via the fastening wall 72A and the fixed bracket 62.

The side support bladder 46 abuts on an inner face of the aforementioned reception face wall 72B in the seat width direction, and a paddle 78 as a turning plate is provided between the side support bladder 46 and the pad side portion 18B. This paddle 78 is formed of, for example, a resin material, and is formed in the shape of a flat plate as shown in FIG. 8. A hook portion 78A that is formed substantially in a J-like shape in a planar cross-sectional view is provided at a rear end edge portion of this paddle 78.

A hook shaft 72B 1 that extends along the vertical direction of the seat back 12 in the axial direction is integrally formed at a rear end portion of the reception face wall 72B in a manner corresponding to the aforementioned hook portion 78A. The hook portion 78A is inserted through a rectangular through-hole 80 that is formed through a rear end portion of the side support bladder 46, and is hooked on the hook shaft 72B1. This hook portion 78A and this hook shaft 72B1 constitute a hinge 72F, and the paddle 78 is rotatably coupled to the airbag case 72 around the hinge 72F.

Therefore, when the side support bladder 46 inflates, the paddle 78 turns inward in the seat width direction around the hinge 72F. When the side support portion 12B swells inward in the seat width direction and the side support bladder 46 contracts, the paddle 78 turns outward in the seat width direction around the hinge 72F, and the side support portion 12B retreats outward in the seat width direction. This embodiment of the invention is basically identical in the configurational details other than the foregoing to the first embodiment of the invention.

In this embodiment of the invention as well as the first embodiment of the invention, when the side support bladder 46 inflates, an inflation reaction force can be applied to the side support bladder 46 by the support body 76 (the reception face wall 72B and the front wall 72C) that is provided on the airbag case 72. Besides, when the side airbag 32 inflates and deploys, the aforementioned support body 76 rotates outward in the seat width direction around the integral hinge 72F together with the side support bladder 46 and the paddle 78 upon receiving an inflation pressure of the side airbag 32, so the side airbag 32 can be allowed to inflate and deploy. Accordingly, this embodiment of the invention achieves an operation and an effect that are basically similar to those of the first embodiment of the invention.

Besides, in this embodiment of the invention, the airbag module 70 itself is made use of as the reception face of the side support bladder 46. Therefore, the structure can be simplified, and the number of parts can be reduced. Besides, the support body 76 can be assembled with the shell frame 14 by assembling the side airbag module 70 with the shell frame 14. Therefore, the man-hour of an assembling operation can be reduced in comparison with a case where the side airbag module and the support body are separately assembled with the shell frame.

The invention has been described above with reference to some embodiments thereof. However, the invention is not limited to these embodiments thereof, but can be carried out after being modified in various manners without departing from the gist thereof. Besides, as a matter of course, the scope of rights of the invention is not limited to the aforementioned respective embodiments thereof.

What is claimed is:

1. A vehicular seat comprising:
a side airbag device that inflates and deploys a side airbag with which a side airbag module that is provided in a side support portion of a seat back is equipped, forward of the side support portion with respect to the seat;
a side support adjustment mechanism that has an air bag that is provided in the side support portion inside the side airbag module in a seat width direction, and that inflates and contracts the air bag; and
a support body that is provided between the side airbag module and the air bag, that is supported by a skeleton of the seat back, that supports the air bag from outside in the seat width direction at a time of inflation of the air bag, and that is displaced inward in the seat width direction together with the air bag due to an inflation pressure of the side airbag at a time of inflation and deployment of the side airbag.

2. The vehicular seat according to claim 1, wherein
the support body has an abutment portion that abuts on the skeleton of the seat back from inside in the seat width direction.

3. The vehicular seat according to claim 1, wherein
the skeleton of the seat back is a shell frame having a rear wall portion that is arranged on a back face side of the seat back, and a lateral wall portion that extends forward with respect to the seat from an end portion of the rear wall portion in the seat width direction, and
the side airbag module and the air bag are arranged inside the lateral wall portion in the seat width direction.

4. The vehicular seat according to claim 1, wherein
the support body has a fixed portion that is fixed to the skeleton of the seat back, and a movable portion that is coupled at an end portion thereof on a rear side with respect to the seat to the fixed portion via a hinge and that is arranged between the side airbag module and the air bag, and

the movable portion is allowed to rotate inward in the seat width direction around the hinge, and is restrained from rotating outward in the seat width direction around the hinge.

5. The vehicular seat according to claim **4**, wherein

the side support adjustment mechanism has a turning plate that is interposed between the air bag and a seat back pad in the side support portion, and

the turning plate is coupled at an end portion thereof on the rear side with respect to the seat to the fixed portion via the hinge.

6. The vehicular seat according to claim **1**, wherein

the side airbag module is equipped with an airbag case that accommodates the side airbag therein in a folded state, and

the support body is constituted by a part of the airbag case.

7. The vehicular seat according to claim **6**, wherein

the support body has an abutment portion that abuts on another part of the airbag case from inside in the seat width direction.

8. The vehicular seat according to claim **7**, wherein

the side support adjustment mechanism has a turning plate that is interposed between the air bag and a seat back pad in the side support portion, and

the turning plate is coupled to a hook shaft that is formed on a part of the support body, via a hook portion that is provided at an end portion of the turning plate on a rear side with respect to the seat.

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